

been amended to address this issue. As such, this rejection is respectfully traversed. Claims 8-12 have been cancelled; and thus, the Examiner's rejection as to claims 8-12 is moot.

**Claims 1 and 7-17 are rejected under 35 U.S.C. § 103 for obviousness predicated upon Tsuda et al., U.S. Patent No. 6,262,783 (hereinafter Tsuda) in view of Dunn et al., U.S. Patent No. 5,877,835 (hereinafter Dunn)**

In the sixth enumerated paragraph of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the methodology and liquid crystal display of Tsuda in view of Dunn to arrive at the claimed invention. This rejection is respectfully traversed.

Initially, Applicants note that claims 1, 7-12 and 14-15 have been cancelled; and as such, the Examiner rejection as to these claims is moot. Independent claim 13 recites that a semiconductor film is formed in a picture element region, excluding a region where scanning lines, signal lines, and contact holes are formed. This feature can be shown, for example, in Fig. 14 of Applicants' disclosure.

On page three (fourth full paragraph) of the statement of the rejection, the Examiner asserted that Tsuda teaches the feature discussed above. However, the Examiner neither referred to a reference numeral nor cited a column/line in Tsuda to support this particular assertion. Thus, the Examiner's rejection failed to clearly designate the teachings in the reference being relied upon by the Examiner or clearly explained the pertinence of the applied prior art. In this

regard, the Examiner's rejection fails to comport to the provisions of 37 C.F.R. § 1.104(c).<sup>1</sup>

Furthermore, Applicants have reviewed the teachings of Tsuda, and there is no apparent teaching in Tsuda of a film equivalent to the semiconductor film of the claimed invention.

In the formation of Tsuda, the gate signal wiring, the gate electrode, the common electrode wiring, and the island-like shielding portions each being independent for each picture element are formed, and exposure is performed from a backside. As such, the structure of Tsuda is significantly different from that recited in claim 13. The secondary reference to Dunn does not cure the argued deficiencies of Tsuda, and the Examiner has not alleged that Dunn teaches the claimed semiconductor film. Accordingly, the proposed combination of references would not yield the claimed invention. Applicants, therefore, respectfully submit that the imposed rejection of claim 13 under 35 U.S.C. § 103 for obviousness predicated upon Tsuda in view of Dunn is not viable and, hence, solicit withdrawal thereof.

Independent claims 16 recites peeling (exfoliating) an ultraviolet-cut film 117 before applying a development considering the resistance of the ultraviolet-cut film to chemicals (see for example, Figs. 11b, 11c and pages 40-41 of Applicants' disclosure). A review of the Examiner's statement of the rejection does not yield even an allegation that Tsuda or Dunn teaches or suggests "applying a development after exfoliating said ultraviolet-cut film," as recited in claim 16. Furthermore, a review of Tsuda and Dunn fails to yield a disclosure of such a

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<sup>1</sup> 37 C.F.R. § 1.104(c) provides:

In rejecting claims for want of novelty or for obviousness, the examiner must cite the best references at his or her command. When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.

feature. Thus, the Examiner has failed to establish that the combination of Tsuda in view of Dunn teaches or suggests the claimed invention, as recited in claim 16.

Independent claim 17 recites a process of manufacturing the liquid display that includes the limitations previously discussed with regard to claim 13. As such, Applicants incorporate herein the arguments previously presented in traversing the rejection of claim 13. As there is a difference in structure between claim 13 and Tsuda as mentioned above, the manufacturing process according to claim 17 is also different from Tsuda. Furthermore, while in the claimed invention, exposure is performed from front side twice by replacing the mask, Tsuda differs from the claimed invention by performing exposure from the backside. As such, the process of Tsuda is significantly different from the process recited in claim 17. The secondary reference to Dunn does not cure the argued deficiencies of Tsuda. Accordingly, the proposed combination of references would not yield the claimed invention. Applicants, therefore, respectfully submit that the imposed rejection of claim 17 under 35 U.S.C. § 103 for obviousness predicated upon Tsuda in view of Dunn is not viable and, hence, solicit withdrawal thereof.

**Claims 2-6 are rejected under 35 U.S.C. § 103 for obviousness predicated upon Tsuda in view of Dunn, and further in view of Aggas et al., U.S. Patent No. 5,994,157 (hereinafter Aggas)**

In the seventh enumerated paragraph of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the methodology and mask of Tsuda in view of Dunn and Aggas to arrive at the claimed invention.

Initially, Applicants note that claims 2 and 3 have been placed in independent form.

Independent claim 2 includes the following features:

- (i) The exposure is performed dividedly in plural number of times (at least two times) by a mask provided with an inseparable pattern and by another mask provided with a separable pattern.
- (ii) The inseparable pattern is exposed with a predetermined exposure value, which is 20 to 80% of the exposure value of the separable pattern.
- (iii) Appropriate unevenness is formed within the picture element region.

Tsuda discloses an exposure method in which exposure is performed from a backside of the substrate using the shielding region such as gate signal wiring, and a common electrode wiring as a mask. Furthermore, in order to form contact holes on the drain electrode using a stepper exposure apparatus, exposure is subsequently performed by disposing a photo-mask on the front side. A difference between the claimed invention and Tsuda is that exposure is performed from a backside in Tsuda, while exposure from a backside is not performed in the claimed invention but the exposure is performed being divided into two times by replacing the mask of the stepper exposure apparatus. Moreover, it is not described at all in Tsuda that the exposure value in the exposure from backside is 20 to 80% of the exposure value for forming the contact holes. The secondary references to Dunn and Aggas do not cure the argued deficiencies of Tsuda. Accordingly, the proposed combination of references would not yield the claimed invention. Applicants, therefore, respectfully submit that the imposed rejection of claim 2 under 35 U.S.C. § 103 for obviousness predicated upon Tsuda in view of Dunn and Aggas is not viable and, hence, solicit withdrawal thereof.

Independent claims 3 and 5 include the following features:

- (i) Not less than two layers of shielding member (shielding portion) including an ultraviolet (UV) filter layer such as glass that cuts the ultraviolet by a predetermined value within the range of 20 to 80%.
- (ii) The mentioned ultraviolet filter layer is disposed on the mask pattern opening located at the position conforming to the picture element region, and a mask not having any shielding member (but having a transparent portion) is used in the contact hole pattern area.

In contrast, Tsuda discloses an exposure method in which exposure is performed by disposing a photo-mask on the front side in order to form contact holes on the drain electrode using a stepper exposure apparatus. A difference between the claimed invention and Tsuda is that Tsuda does not disclose any shielding member disposed for cutting the ultraviolet. Moreover, in Tsuda, the exposure is performed just one time by the stepper exposure apparatus, and any appropriate unevenness cannot be formed in the picture element region by just one time exposure. Although Dunn discloses a manufacturing process of a liquid display provided with a film for cutting the ultraviolet on the surface of a substrate, Dunn does not disclose the requirement of performing the exposure two times. Applicants, therefore, respectfully submit that the imposed rejection of claims 3 and 5 under 35 U.S.C. § 103 for obviousness predicated upon Tsuda in view of Dunn and Aggas is not viable and, hence, solicit withdrawal thereof.

Claim 6, dependent upon claim 5, includes the following features:

- (i) An a-Si layer is used as an ultraviolet filter.
- (ii) A Cr/CrO<sub>x</sub> film is used as a shielding member for completely shielding the ultraviolet.

Although Aggas discloses that an a-Si film is used as an ultraviolet blocking layer, the ultraviolet blocking layer is formed on the backside of the TFT substrate and is not provided on the exposure mask. Therefore, Aggas does not suggest claim 6 of the invention.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Applicants have made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicants invite the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. Accordingly, and in view of the foregoing remarks, Applicants hereby respectfully request reconsideration and prompt allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417, and please credit any excess fees to such deposit account.

Respectfully submitted,

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**Version with markings to show changes made**

**IN THE CLAIMS:**

2. (Amended) [The] A method for manufacturing a reflection type liquid crystal display, comprising [according to claim 1]

forming plural scanning lines and plural signal lines crossing said scanning lines on an insulating substrate;

forming a switching element in each of picture element regions divided by said scanning lines and said signal lines;

forming an interlayer insulating film having appropriate unevenness of an inseparable pattern in the picture element region and having a contact hole of a separable pattern on a drain electrode of said switching element by plainly applying a photosensitive insulating resin on said substrate so as to dissolve difference in level caused by said scanning lines, said signal lines, and said switching element, and conducting exposure and development while changing an amount of exposure; and

forming a reflex picture element electrode having unevenness due to said interlayer insulating film at a position conforming to each of the picture element regions and which is electrically connected to said switching element through said contact hole, by patterning after forming a high reflex film on said interlayer insulating film, wherein

in the process of forming the interlayer insulating film, the insulating resin is exposed by divisional (split) exposure in which the inseparable pattern and the separable pattern are arranged on different masks, and

said inseparable pattern is exposed by a predetermined exposure amount of 20 to 80 % of the exposure amount for said separable pattern.

3. (Amended) [The] A method for manufacturing a reflection type liquid crystal display, comprising [according to claim 1]

forming plural scanning lines and plural signal lines crossing said scanning lines on an insulating substrate;

forming a switching element in each of picture element regions divided by said scanning lines and said signal lines;

forming an interlayer insulating film having appropriate unevenness of an inseparable pattern in the picture element region and having a contact hole of a separable pattern on a drain electrode of said switching element by plainly applying a photosensitive insulating resin on said substrate so as to dissolve difference in level caused by said scanning lines, said signal lines, and said switching element, and conducting exposure and development while changing an amount of exposure; and

forming a reflex picture element electrode having unevenness due to said interlayer insulating film at a position conforming to each of the picture element regions and which is electrically connected to said switching element through said contact hole, by patterning after forming a high reflex film on said interlayer insulating film, wherein

in the process of forming the interlayer insulating film, [the masks] a mask is used in exposing the insulating resin [have] and has a shading material comprised of at least two layers, the at least two layers including an ultraviolet filter layer for cutting ultraviolet rays at a



predetermined value of 20 to 80 % in a base material [such as glass], and said ultraviolet filter layer is laid in a mask pattern opening portion located conforming to the picture element region.

4. (Twice Amended) A reflection type liquid crystal display manufactured according to claim [1] 2.

5. (Amended) A mask for manufacturing a reflection type liquid crystal display, the liquid crystal display including [comprising:]

a first insulating substrate provided with scanning lines and signal lines formed into a lattice configuration, a TFT, an interlayer insulating film, and a reflex picture element electrode [, and so on];

a second insulating substrate [which is provided with] having a color filter[,] and an opposed electrode [and so on,] and [is] arranged [to be] opposite to the first insulating substrate; and

a liquid crystal [put] between said substrate; [wherein]

the [reflection type liquid crystal display] mask comprising: [further comprises]

a shading material of at least two layers, the at least two layers including an ultraviolet filter layer for cutting ultraviolet rays at a predetermined value of 20 to 80 % in a base material [such as glass], said ultraviolet filter layer being laid in a mask pattern opening portion located conforming to a picture element region.

Please add the following:

--18. (New) A reflection type liquid crystal display manufactured according to claim 3.--

**IN THE ABSTRACT:**

Please delete the entire abstract and replace with the following:

--A reflection type liquid crystal display is formed by an [of high aperture efficiency driven by low electric power and superior in display quality is stably obtained through a simple process.

Further, a reflection type liquid crystal display of good reflection characteristic and high display quality is obtained in a high yield by forming appropriate unevenness on a reflex picture element electrode.

An] interlayer insulating film [11] having appropriate unevenness of an inseparable pattern in a picture element region and having a contact hole [12] of a separable pattern on a drain electrode [8] of a TFT is formed by plainly applying a photosensitive insulating resin so that it may dissolve difference in level caused by a gate electrode wiring [2], source electrode wiring [7], and the TFT, [and so on,] and conducting exposure and development while changing exposure amount. The exposure of the insulating resin is conducted through divisional exposure in which the inseparable pattern and the separable pattern are arranged on different masks, and the inseparable pattern is exposed by a predetermined exposure amount of 20 to 80 % of an exposure amount for the separable pattern.[ For example, a stepper exposure apparatus of h-rays

is used, and the contact hole 12 portion is exposed at  $400 \text{ mj/cm}^2$  and the unevenness in the picture element region is exposed at  $160 \text{ mj/cm}^2$ .

An insulating substrate 101, in which an ultraviolet absorption film 101b and an insulating layer 101c are formed on a transparent insulating substrate 101a, and which is treated not to permit any ultraviolet light to transmit, is used as a substrate for forming a TFT array. As a result, at the time of exposing a photosensitive resin forming an interlayer insulating film 111 which is formed on the TFT and the electrode wiring and makes the surface plain, any ultraviolet light not absorbed by the photosensitive resin does not transmit through the substrate, and the photosensitive resin is prevented from being exposed by inappropriate light such as light reflected from a substrate holder.]--